

EPA Update Groundwater and Vapor Intrusion Sampling

**Wescoat and Former Orion Park Housing Areas
Moffett Field, CA**

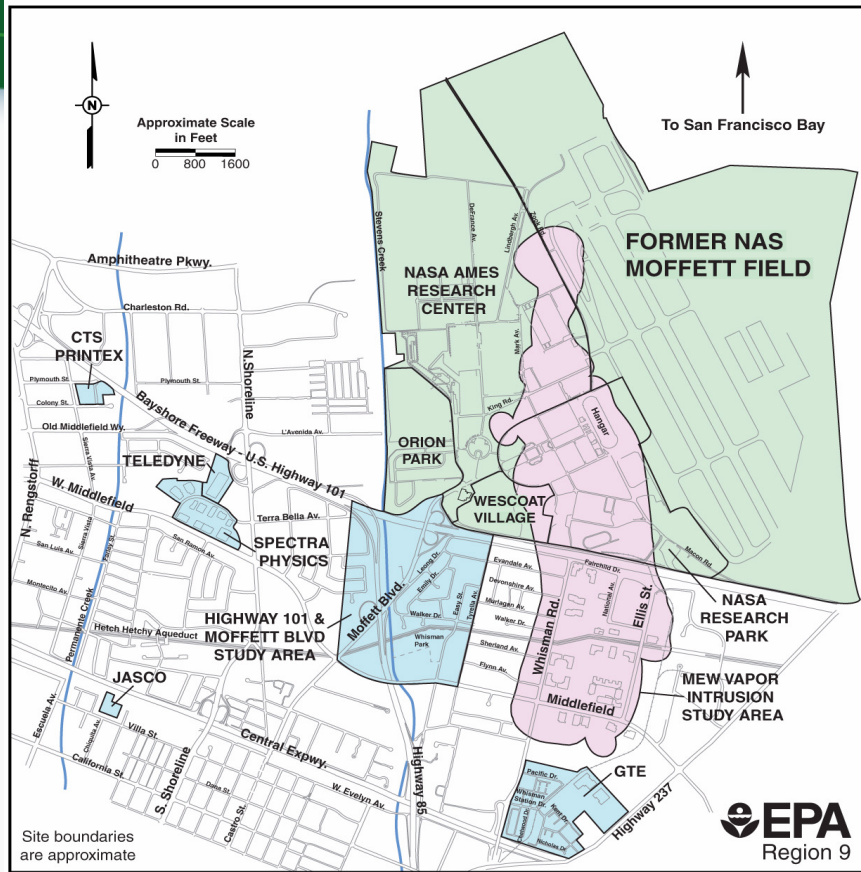
**Community Meeting
April 15, 2013**

Overview

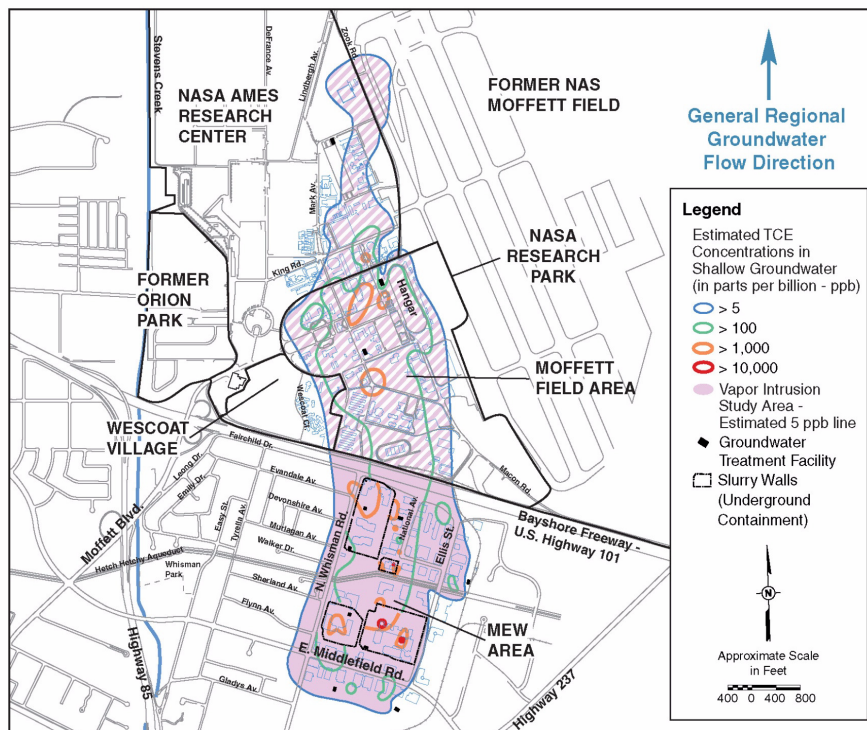


- Introductions
- Background
- Vapor Intrusion Pathway and TCE
- Recent Groundwater Sampling
- Recent Indoor Air Sampling and Next Steps
- Questions

MEW SITE LOCATION AND VICINITY



Estimated Extent of Shallow TCE Groundwater Plume - 2009



MEW Regional Plume Groundwater Cleanup Progress



- Groundwater pump and treat to clean up and contain contamination. The TCE groundwater cleanup level is 5 micrograms per liter or parts per billion (ppb).
- Over 90 extraction wells pump approximately 500 gpm to 11 treatment systems.
- Over 5.25 billion gallons groundwater treated and over 100,000 pounds of contaminants removed, primarily TCE.
- Annual sampling of approximately 500 monitoring wells
- Water level measurements of nearly 1000 wells
- Note: Groundwater in this area is not used for drinking water or other potable use.

Orion Park Plume Status



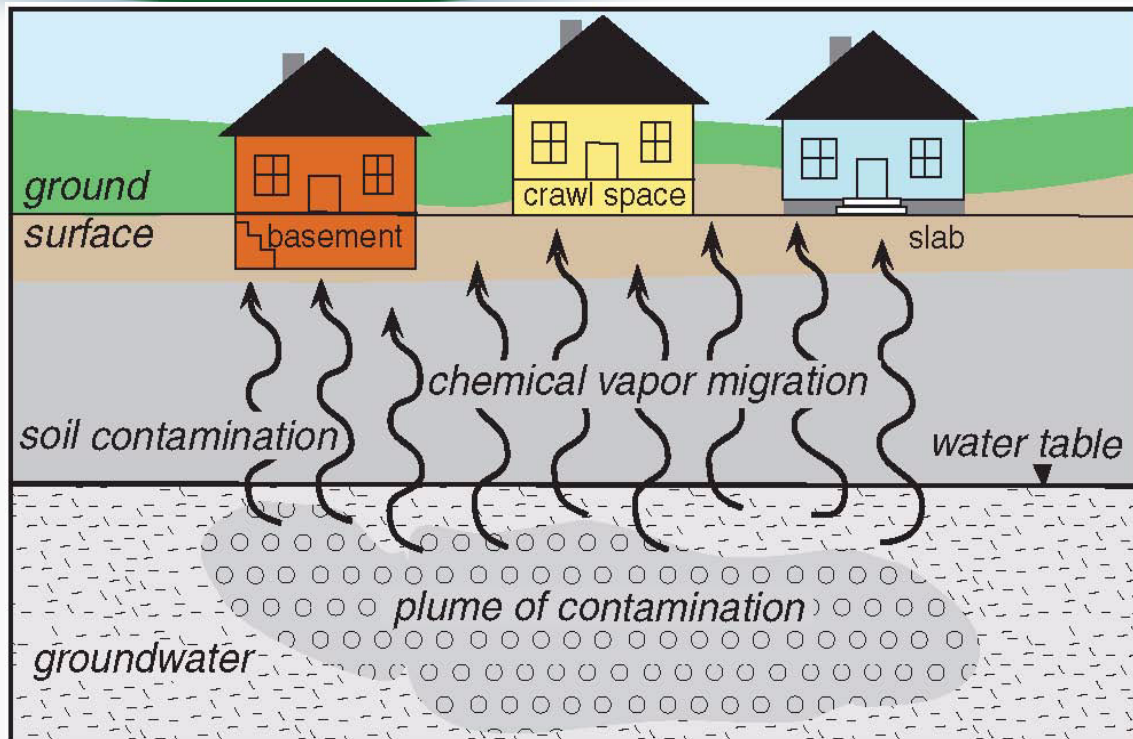
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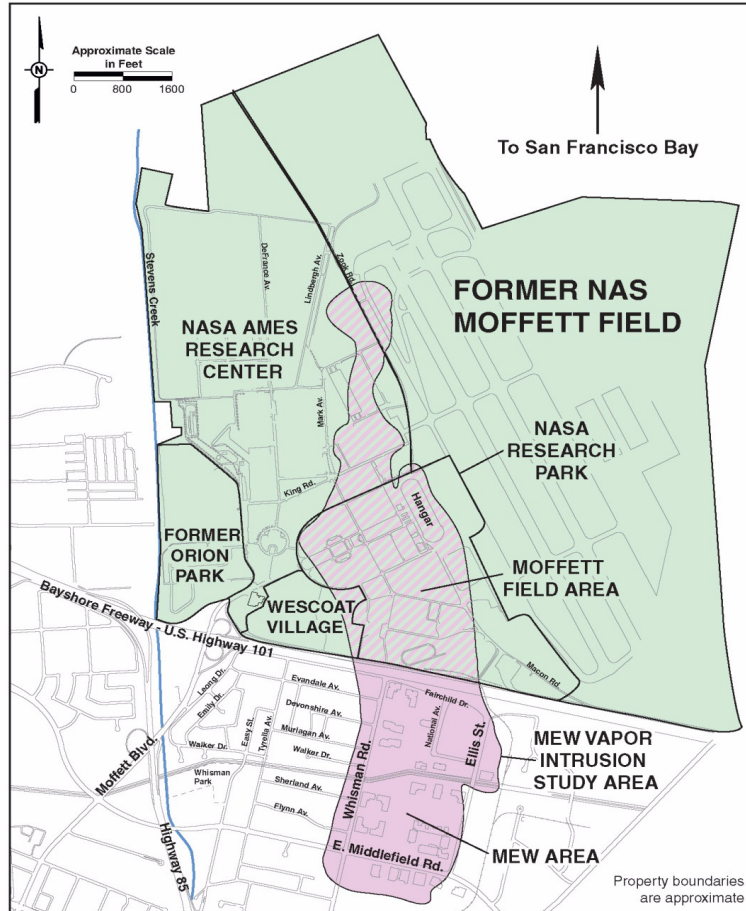
Drinking Water at Moffett Field



- Municipal water is supplied by San Francisco Public Utilities Commission
- Majority drinking water from Hetch Hetchy Reservoir in the Sierra Nevada near Yosemite
- Information regarding drinking water available on NASA Ames website
(http://environment.arc.nasa.gov/arc_water_rep/index.html)
- Report of brown/yellow water coming from tap at Wescoat Housing Area in March 2013
- NASA recommends to Wescoat Housing that lines in area flushed on regular basis

Vapor Intrusion Pathway





MEW Vapor Intrusion Study Area



- All buildings overlying the shallow groundwater contamination
- Defined by the area where TCE concentrations in shallow groundwater are greater than 5 micrograms per liter (ug/L), or parts per billion (ppb)

What is TCE and Why is it a concern?



- TCE or trichloroethene is a solvent used that was widely used in past for degreasing and cleaning.
- Can readily evaporate into air and has potential to migrate from shallow contaminated groundwater upwards into overlying buildings through the **vapor intrusion pathway**.
- If TCE in indoor air at high enough levels and high enough duration, it may pose a potential health concern.

Potential Health Effects of TCE



- In September 2011, EPA finalized TCE Health Assessment (see *Toxicological Review of TCE* <http://www.epa.gov/iris/subst/0199.htm>)
- Assessment concluded TCE is human carcinogen. Can cause cancer in humans if exposed to high enough concentration for a long enough period of time.
- TCE can also affect the central nervous system, kidneys and liver, male reproductive organs and the developing fetus.

Potential Health Effects associated with TCE



- **Non-cancer**

- Acute effects-neurological
- Various organ systems
 - Liver
 - Kidney
- Immunological
- Reproductive
- Developmental

- **Cancer**

- Kidney
- Liver
- Lymphoma

- **Mode of Action**

- Mutagenic
- through metabolites

Potential Health Effects of TCE Depend on Many Factors



Potential health effects of TCE depend on many factors including:

- General health, age and lifestyle of the person
- How much a person is exposed to TCE (amount, duration)
- How often a person is exposed (frequency of exposure)

Recent Findings - Groundwater Work MEW Plume



- Plume margins unchanged in Wescoat Housing Area; majority of housing area outside the 5 parts per billion TCE groundwater contamination plume in shallow groundwater
- Plume margins confirmed in each area of the MEW plume with the exception of residential area south of 101
- High TCE concentrations in two “hot spot” areas along Evandale Avenue (south of highway 101).

Indoor Air Sampling MEW Plume



- X and X samples collected throughout plume
- Wescoat Housing constructed with sub-slab veintilation systems in 2006 as a precautionary measure
 - Representative units sampled in 2006; TCE was not detected in only one unit
 - Unit resampled and not-detected for TCE

TCE Groundwater Results Along Western Margins of Plume in Shallow Aquifer (0 to 40 feet bgs)

Wescoat Housing Area- North of Highway 101 on Moffett Field

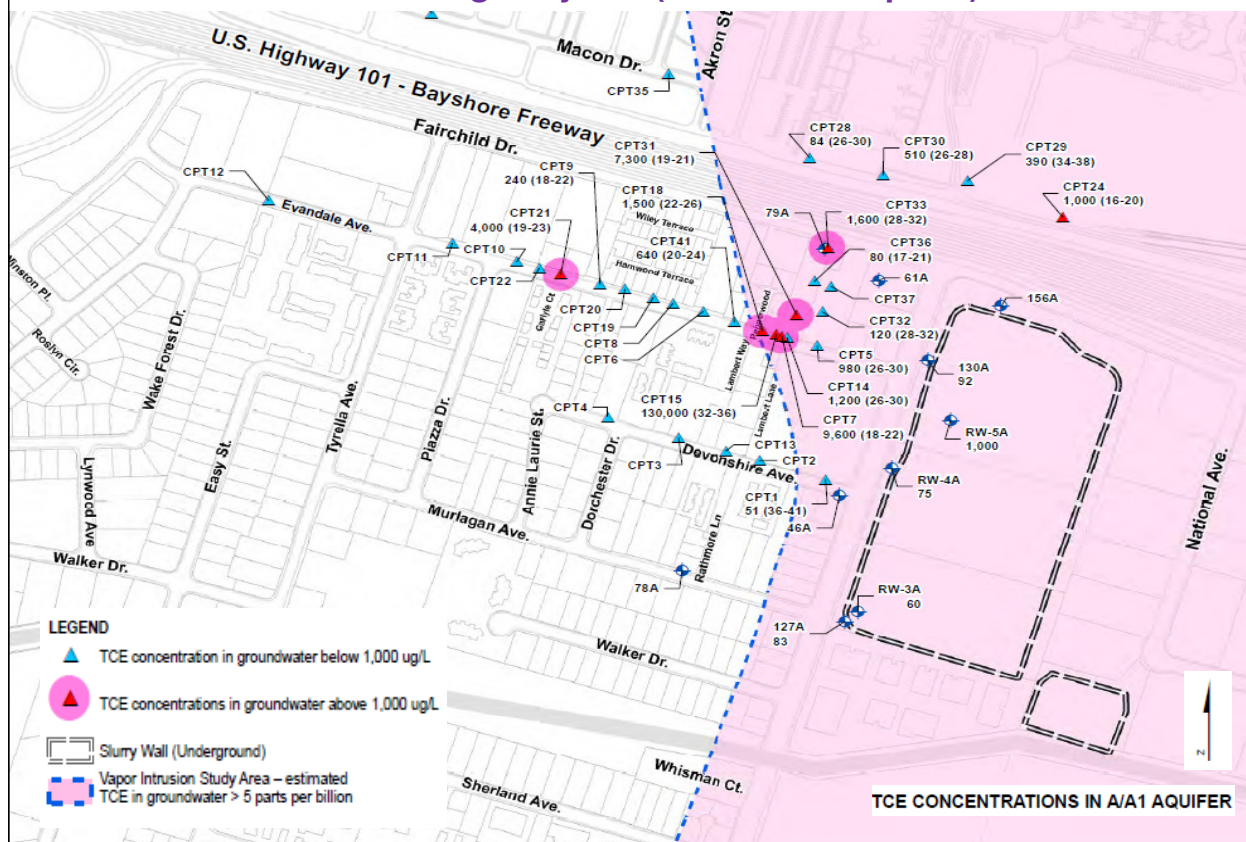


TCE Groundwater Results Along Western Margins of Plume in B1/A2 Aquifer (40 to 75 feet bgs)

Wescoat Housing Area- North of Highway 101 on Moffett Field



Maximum TCE Groundwater Results Western Margins – South of Highway 101 (Shallow A Aquifer)



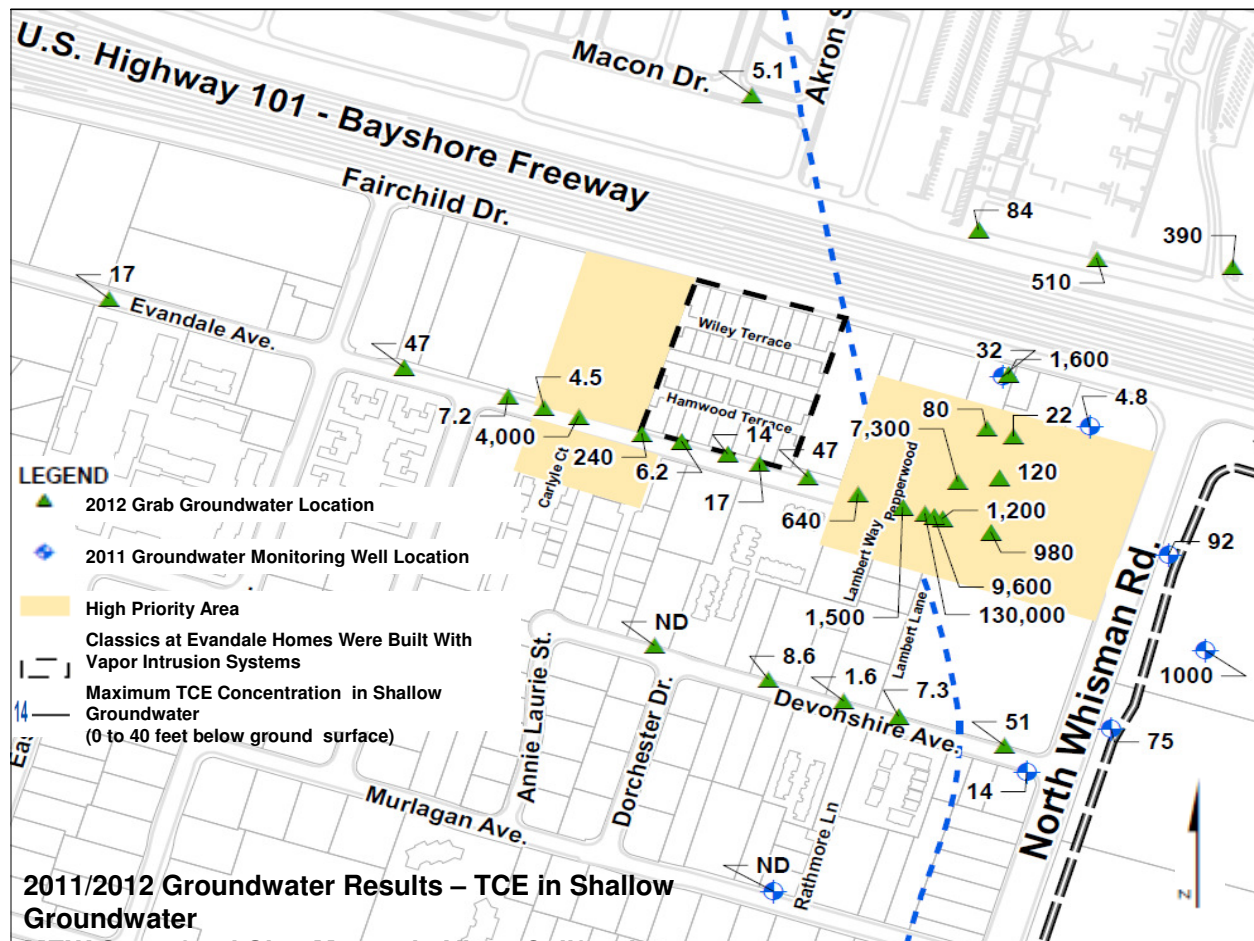
MEW Groundwater Plume – Next Steps

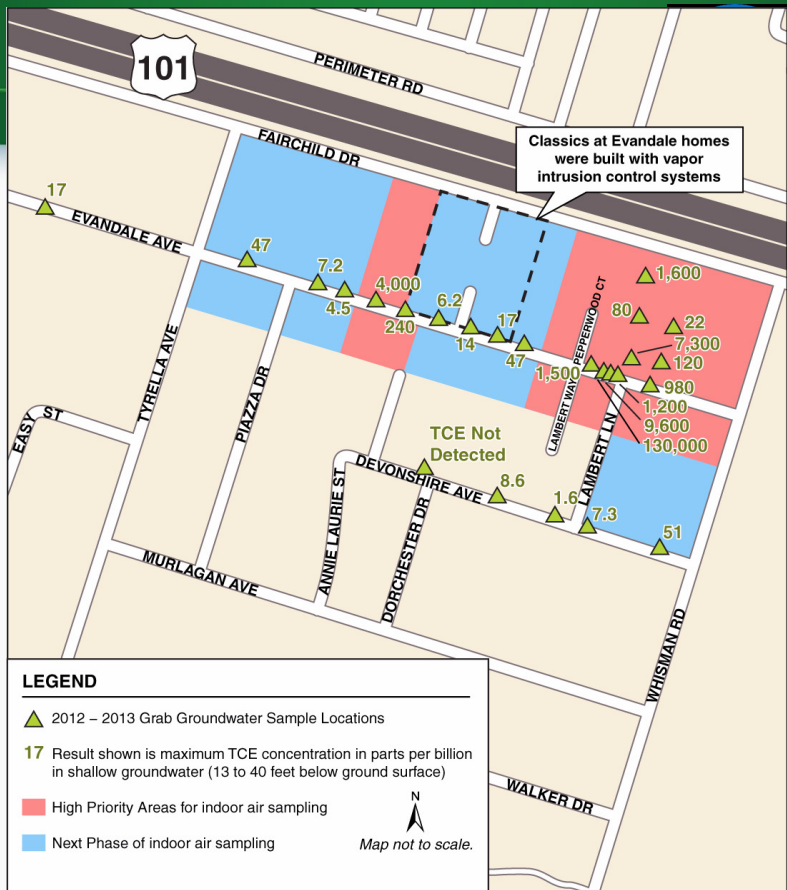


- Finalize report summarizing recent groundwater data collected throughout the MEW plume
- Install additional monitoring wells within the MEW plume boundary; one additional well will be installed near the Wescoat Housing Area
- Implement remedy to address hot spots in the residential area south of 101

Orion Park Plume– Next Steps







2012 – 2013 Groundwater Results - TCE in Shallow Groundwater

INDOOR AIR STANDARD FOR TCE (MEW STUDY AREA)

Health-Based Criteria

- Protective of Cancer Effects
- Protective of Non-Cancer Effects
- Protective of both Short-Term and Long-Term Exposures

Margin of Safety

- Accounts for Sensitive Groups
- Data Gaps in the Science

Other Considerations

- Can be Reliably Measured using Current Laboratory Methods
- Typically Above "Background" TCE Levels Measured in Mountain View Air
- Two TCE Standards Account for Different Exposures that Occur in Homes vs. the Workplace

Residential Standard for TCE in Air = $1 \mu\text{g}/\text{m}^3$
Worker Standard for TCE in Air = $5 \mu\text{g}/\text{m}^3$

$\mu\text{g}/\text{m}^3$ = micrograms
per cubic meter



Initial Indoor Air Sampling Results



- EPA sampled 30 residences in high priority areas
- No TCE was detected in most residences sampled.
- TCE was detected in a few residences, but below indoor air cleanup levels. Homes re-sampled to confirm TCE below indoor air cleanup levels.
- TCE was found in two residences exceeding EPA's TCE indoor air cleanup level.
- Vapor intrusion control systems installed to mitigate concentrations

Next Steps - Vapor Intrusion



- Results from high priority area sampling showed vapor intrusion not a problem in most residences sampled.
- Based on groundwater and air sampling to date, areas outside the high priority areas that overly lower TCE groundwater concentrations are considered as low vapor intrusion risk
- Residents have option to have homes sampled if in the expanded vapor intrusion study area
- Next phase of sampling to begin March 2013

How do I have my residence sampled?



Residences within MEW Site Vapor Intrusion Study Area – overlying shallow TCE groundwater contamination exceeding 5 ppb

- Contact EPA with your residence address, phone number, and email, and EPA representative will get in touch with you.
- Permission to sample must be obtained from property owner.
- Ground floor units without vapor intrusion control systems

What if there is a vapor intrusion problem in home?



- If indoor air sampling results show TCE from vapor intrusion exceeding EPA's indoor air cleanup level of 1 ug/m^3 , EPA recommends installation of a vapor intrusion control system
- Includes sealing potential conduits and installing sub-slab or sub-membrane vapor intrusion control system
- At no cost to homeowner or resident

EPA Contact Information



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EPA Websites – For More Information

www.epa.gov/region9/mew

www.epa.gov/region9/moffettfield

www.epa.gov/oswer/vaporintrusion

